Chatillon®
TCD Series Frames

For Use with TCD110, TCD225 and TCD1100 Series Digital Force Testers

User's Guide

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TCD Frame User's Guide

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Product Warranty

This instrument is warranted against defects in workmanship, material and design for one (1) year from date of delivery to the extent that AMETEK will, at its sole option, repair or replace the instrument or any part thereof which is defective, provided, however, that this warranty shall not apply to instruments subjected to tampering or, abuse, or exposed to highly corrosive conditions.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED AND AMETEK HEREBY DISCLAIMS ALL OTHER WARRANTIES, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY. AMETEK SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO, ANY ANTICIPATED OR LOST PROFITS.

This warranty is voidable if the purchaser fails to follow any and all instructions, warnings or cautions in the instrument's Instruction Manual.

If a manufacturing defect is found, AMETEK will replace or repair the instrument or replace any defective part thereof without charge; however, AMETEK's obligation hereunder does not include the cost of transportation which must be borne by the customer. AMETEK assumes no responsibility for damage in transit, and any claims for such damage should be presented to the carrier by the purchaser.

Precautions

- **Read the TCD Frame User's Guide and TCD Console User's Guide completely before attempting to use the TCD Series System.** By following the instructions contained in this manual, the optimum accuracy and performance can be attained.
- **Never operate the TCD Series System with the cover removed from the TCD Console or TCD Frame.**
- **Use and industrial-quality Power Surge Suppressor with your TCD System.**
- **Verify Input Power Source BEFORE operation.** The TCD System has a switchable power supply. The tester may operate with 110V or 230V provided the Power Input Module is in the proper setting corresponding to the source power. Always make sure that the supply power matches the setting on the Power Input Module before turning power ON. Failure to do so may cause serious damage to the tester.
- **The TCD Frame has a moving crosshead!** Exercise extreme caution during testing or whenever the crosshead is moving. Never place fingers inside the column.
- **Class 1 product must be connected to a mains socket outlet with a protective earth connection.**
- **Place TCD System so that it is easy to access the mains power switch and mains power cord.**
- **Never use the TCD System in a manner not specified by AMETEK.**
- **Obey all warning labels on your TCD frame.**

Icons

WARNING

The raised hand icon warns of a situation or conditon that may lead to personal injury or death. Do not proceed until the warning is read and thoroughly understood. Warning messages are shown in bold type.

DANGEROUS VOLTAGE

The lightning icon warns of the presence of an uninsulated dangerous voltage within the product enclosure that might be of sufficient magnitude to cause serious shocks or death. Never open the enclosures unless you are an authorized and qualified Chatillon service personnel. Never open any enclosure when power is connected to the system or its components.

CAUTION

The exclamation point icon indicates a situation or condition that may lead to equipment malfunction or damage. Do not proceed until the caution message is read and thoroughly understood. Caution messages are shown in bold type.

NOTE

The note icon indicates additional or supplementary information about the action, activity or concept. Notes are shown in bold type.

GENERAL SAFETY

General safety precautions must be followed when operating the TCD System. Failure to observe precautions and warnings may result in damage to the equipment, or injury to personnel.

It is understood that safety rules within companies vary. If a conflict exists between the material contained in all TCD User's Guides and the rules of a company using a TCD System, the more stringent rules should take precedence.

SAFETY CONSIDERATIONS

The TCD Frame is completely enclosed and provides no potentially hazardous outputs. Safety considerations are related to the power connections and physical mountings.

Electronic and mechanical components housed within the TCD covers are to be serviced by authorized Chatillon representatives only.

Unpacking Your TCD Frame

The TCD frame connects to the TCD Console and uses a TLC Series load cell to provide you with an extremely easy-to-use and accurate measurement system for various types of physical testing.

Carefully remove your TCD frame from its shipping carton.

NOTE
AMETEK recommends the use of a crane when positioning the TCD1100 Series Digital Force Tester.

NOTE
Save the shipping carton and packaging material in case future reshipment becomes necessary.

The items listed below are supplied standard with your TCD Frame.

TCD110 Series

- TCD110 Frame
- TCD Console
- Power Cords
  - 120V US Plug (SPK-FM200-034)
  - 230V UK Plug (SPK-FM200-022)
  - 230V EU Plug (SPK-LTCMUK230)
- Console-Frame Cable (SPK-TCD-024)
- Console Mounting Kit (SPK-TCD-002)
- Base Mounting Accessories
  - Base Plate
  - 5/8” Eye End
  - Locking Rings
  - #10-32 Thread Adapter
  - 5/16-18 Thread Adapter
  - Spanner Wrench (NC003030)
- 1GB Flash Memory Drive (NC003011)
- 5mm Hex Key (NC002924)
- 5/32” Hex Key (NC000846)

TCD225 Series

- TCD225 Frame
- TCD Console
- Power Cords
  - 120V US Plug (SPK-FM200-034)
  - 230V UK Plug (SPK-FM200-022)
  - 230V EU Plug (SPK-LTCMUK230)
- Console-Frame Cable (SPK-TCD-024)
- Console Mounting Kit (SPK-TCD-002)
- Base Mounting Accessories
  - Base Plate (NC
  - 5/8” Eye End (NC
  - Locking Rings (NC
  - #10-32 Thread Adapter
  - 5/16-18 Thread Adapter
  - Spanner Wrench (NC003030)
- 1GB Flash Memory Drive (NC003011)
- 5mm Hex Key (NC002924)
- 5/32” Hex Key (NC000846)

TCD1100 Series

- TCD1100 Frame
- TCD Console
- Power Cords
  - 120V US Plug (SPK-FM200-034)
  - 230V UK Plug (SPK-FM200-022)
  - 230V EU Plug (SPK-LTCMUK230)
- Console-Frame Cable (SPK-TCD-024)
- Console Mounting Kit (SPK-TCD-002)
- Base Mounting Accessories
  - Base Plate
  - 5/8” Eye End
  - Locking Rings
  - #10-32 Thread Adapter
  - 5/16-18 Thread Adapter
  - Spanner Wrench (NC003030)
- 1GB Flash Memory Drive (NC003011)
- 5mm Hex Key (NC002924)
- 5/32” Hex Key (NC000846)

Specifications

	TCD110 Series	TCD225 Series	TCD1100 Series
Load Capacity	110 lbf, 50 kgf, 500 N	225 lbf, 100 kgf, 1 kN	1124 lbf, 5 kN
Maximum Speed (per min)	20 in, 510 mm	50 in, 1270 mm	40 in, 1020 mm
Minimum Speed (per min)	0.001 in, 0.02 mm	0.001 in, 0.02 mm	0.001 in, 0.02 mm
Return Speed	User- Selectable	User- Selectable	User-Selectable
Crosshead Travel	15.0 in, 380 mm	20.0 in, 510 mm	30.0 in, 762 mm
Instrument Weight (approx.)	65 lbs, 30 kg	75 lbs, 34 kg	187 lbs, 85 kg
Shipping Weight (approx.)	86 lbs, 39 kg	96 lbs, 43 kg	216 lbs, 98 kg

Load Measurement System - TLC Series Load Cells
- Accuracy better than 0.1% Full Scale
- Calibrate On-site to Better than 0.25% Reading
- Measuring system meets or exceeds the following: ASTM E4, BS 1610, DIN 51221, ISO 7500-1, EN 10002-2, AFNOR A03-501 *(AMETEK recommends system verification on-site at the time of installation by an authorized Chatillon Representative, as required by ASTM E4 and ISO 7500-1)*

Strain Measurement System
- Position accuracy better than 0.001 in (0.02mm) or 0.05% displacement (whichever is greater)
- Strain measurement system meets or exceeds the following: ASTM E83, BS 3846, ISO 9513, EN 10002-4
- Deflection Compensation Standard

Speed Accuracy
- Better than 1% Full Scale

Distance Accuracy
- Better than 0.25% of reading unloaded
- Distance Resolution is .001 inch or .02 mm

Conformance
- The system conforms to all relevant European standards and carries the CE mark.

BS EN 61010-1:2001
Safety Requirements for Electrical Equipment

BS EN 61000-6-3:2007
EMC Generic Emissions Standard

BS EN 61000-6-1:2007
EMC Generic Immunity Standard

Data Sampling
- 1000Hz
- User Selectable Sampling/Filters (1-1000 Hz)

Operating Temperature
- 40°F to 110°F (5°C to 45°C)

Storage Temperature
- 0° to 130°F (-17° to 54°C)

Relative Humidity
- 20% to 85%

Single Phase Voltage
- 100, 120, 220 or 240Vac ±10%, 47 to 63Hz. Power must be free of spikes, surges, and sags exceeding 10% of the average voltage.

Warranty
- 1 year

These specifications were developed in accordance with AMETEK's standard procedures and are subject to change without notice.

Handling Your TCD Frame

When attempting to pickup your TCD frame, always make sure that you are grasping the metal base and NOT the plastic housings that envelop the metal based.

CAUTION

Always make sure you are grasping onto the metal base and crosshead when attempting to move your TCD frame. Do NOT grasp onto any of the plastic housing components. These components are not designed to carry a load or support the weight of the frame.

CAUTION

The TCD1100 Series frame weighs approximately 190 lbs (85 kg), therefore extreme care should be taken when moving this machine.

Shown: Correct handling.

Shown: Incorrect handling.

Understanding Your TCD System

The Chatillon TCD System is comprised of three subsystems that connect and integrate together to form a precision force measurement instrument. The following subsections provide a brief description of each of these subsystems that make up your TCD System.

TCD Frame Subsystem

The TCD frame subsystem provides the motion control for your force measurement testing. This subsystem provides the main power source for the TCD Console subsystem and TLC Series load cell.

The TCD frame consists of a closed-loop PID motor controller that accurately positions the crosshead using a precision ball screw assembly.

TCD Console Subsystem

The TCD Console subsystem is the primary user interface for your TCD System. The TCD Console is used to setup your TCD System operating parameters; test setups; and how measured results are displayed to the user. The TCD Console connects to the TCD frame using a special console-to frame interface cable.

TLC Series Load Cell

The TLC Series load cell is used exclusively with the TCD System to provide accurate load measurement of your samples in either compressive or tensile directions. The TLC Series load cell is a full-bridge strain gauge sensor with 15-pin plug that connects to the TCD Console subsystem.

Assembling Your TCD System

Mounting the TCD Console

The TCD Console Subsystem comes with two mounting adapters. The console base adapter fastens directly to the TCD Console. The TCD Console is secured to the swivel slots on the base adapter by a shoulder screw, a hex head screw and associated washers as shown.

Assembly the TCD Console to the base adapter as shown. Tighten the shoulder screw, and then tighten the hex head screw and washers so that the TCD Console can be adjusted to various tilt positions.

Attach the base adapter to the column arm. The column arm has two mounting slots that use1/4-20 x 3/4" hex head screws and washers. Secure the column arm to the base adapter by tightening the two hex head screws and washers with a wrench.

The column arm adapter has handscrew mechanism that allows you to position the TCD Console so that it is comfortable for the user. Support the TCD Console with your hand while you slowly loosen the handscrew. Once the TCD Console is free to move, position the console where it can be easily viewed and operated by the user. Once you have positioned the console, tighten the handscrew so that the console is secured in the intended position.

CAUTION

Always support the TCD Console whenever adjusting the column arm or base adapter. If the TCD Console falls from the mounting location, serious injury or damage to the equipment can result.

Shown: TCD Console base adapter is connected to the bottom of the TCD Console with hex head screws.

Shown: TCD Console base adapter swivel slot can be adjusted to tilt the console for optimum viewing.

Shown: Attach swivel arm to ball at bottom of console adapter.

Locating Your TCD System

Your Chatillon TCD System is a sensitive measuring instrument. Take care to locate your system in a clean, dry and well-lighted location. Make sure that there is sufficient working area to promote a safe working environment for the operator(s). Never locate your TCD System near equipment that may vibrate or that may elicit high voltage spikes, e.g. generators.

Temperature Considerations

Your Chatillon TCD System is specified to provide accurate measurements when operated in an environment that meets this temperature specification:

- 40° to 110° F (5° to 45° C)

Relative Humidity Considerations

Your Chatillon TCD System has been tested to meet its performance specification where the relative humidity within the work area is between 20% to 85% non-condensing.

- 20% to 85% non-condensing

Vibration Considerations

The TCD System is a precision measuring instrument. The system should be mounted in a location that is free of vibration. Vibration will effect the load measurement result.

RFI Considerations

The TCD System has been determined to meet generic emmissions and noise immunity standards. However, because the system is a precision measuring device it should not be placed near equipment that may produce transient electrical spikes such as generators and pumps. Load readings may be affected at the following frequencies: 368+/-2 MHz, 405+/-5 Mhz, 460+/-2 MHz, 570+/-2 MHz, 598+/-2 MHz, 644+/-2 MHz, 828+/-2 MHz and 1682+/-2 MHz.

ESD Considerations

The TCD System may terminate a test if a high voltage discharge occurs near the connectors, located on the console's back panel. In the unlikely event that a high voltage discharge occurs at the back panel, please power cycle the machine.

Mounting Your Load Cell

Your TCD System uses the Chatillon TLC Series load cell for its load measurement system. Before connecting the TLC load cell cable to the TCD Console, we suggest that you first mount the TLC load cell to the load cell adapter (p/n SPK-TCD-051).

CAUTION
Before connecting the TLC Load Cell, make sure that power to the TCD Console is OFF.

The universal load cell adapter has three different mounting holes used to connect to your TLC Series load cell's threads.

Depending on the model TLC Series load cell being used, insert the appropriate hex cap screw into the TLC load cell being careful not to apply excessive force onto the sensor by over tightening (finger tight is sufficient).

The load cell adapter has a retaining wall that helps to ensure that your TLC load cell is properly aligned. Make sure that the TLC load cell is in contact with the retaining wall.

CAUTION
Make sure your load cell is mounted correctly using the proper load cell adapter location. Always make sure the load cell is mounted so that its surface is flat against the mounting adapter's machined surface.

Position the TLC load cell onto the load cell adapter so that the cable coming from the sensor is positioned nearest the column (left side of the sensor).

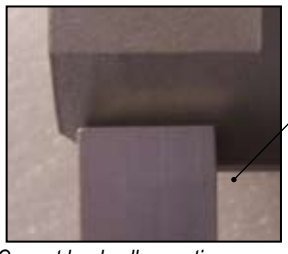
Connect the TLC load cell's connector to the TCD Console (See Cable Connections).

Shown: Correct mounting.

Shown: Incorrect mounting.

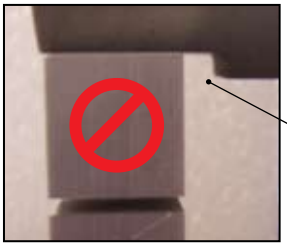
NOTE
Your Chatillon TLC or SLC Series load cells have an active side. Looking directly at the load cell, the load cell should be mounted so that the cell creates an "S" pattern. The load cell's part number or capacity should be oriented so that it can be read rightside upwards.

Shown: Fasten top of load cell to bottom of load cell adapter using cap head screw. Access cap screw using thru-holes on adapter.



Sensor is tight against the adapter.

Shown: Correct load cell mounting.



Sensor is NOT tight against the adapter.

Shown: Incorrect load cell mounting.

Mounting Your Test Fixtures

The TLC load cells can use threaded or 5/8-inch eye end-type grips and fixtures.

Chatillon GF Series grips or fixtures mate to the TLC Series load cell using a threaded connection. Because these grips or fixtures may have different size threads, it may be necessary to use thread adapters for your connection.

CAUTION
When using threaded-type grips and fixtures, exercise extreme care not to over tighten the threads. Over tightening may damage the load cell.

Chatillon TG Series grips and fixtures have a 5/8-inch eye end connection making it easy to mount and align your fixtures.

The TLC load cell mounting threads are shown in the table. Also listed is the fixture mounting accessory kit that comes standard with your TLC load cell. This kit allows you to easily mount and align fixtures/grips that have a 5/8-inch eye end/anchor pin.

Model	Thread	Mounting Kit
TLC-250G	#10-32F	SPK-TLC-001
TLC-0002	#10-32F	SPK-TLC-001
TLC-0010	#10-32F	SPK-TLC-001
TLC-0025	#10-32F	SPK-TLC-001
TLC-0050	1/4-28F	SPK-TLC-002
TLC-0100	1/4-28F	SPK-TLC-002
TLC-0200	1/4-28F	SPK-TLC-002
TLC-0500	1/2-20F	SPK-TLC-003
TLC-1000	1/2-20F	SPK-TLC-003

Your TLC Series load cell is supplied with fixture mounting accessories. These accessories are listed below . You may order the mounting accessories as spare parts.

Load Cell Assemblies

Part No.	Description
SPK-TLC-001	**Low** Capacity TLC Sensor Assembly (No Load Cell)
NC003141	Grip Pin, Aluminum
NC003139	5/8" Eye End with #10-32 Thread, Aluminum
NC003140	Locking Rings (1 ea), Aluminum
SPK-TLC-002	**Medium** Capacity TLC Sensor Assembly (No Load Cell)
NC000612	Grip Pin, Stainless Steel
NC003137	5/8" Eye End with 1/4-28M Thread, Stainless Steel
NC003031	Locking Rings (2 ea), Stainless Steel
NC003030	Spanner Wrench
SPK-TLC-003	**High** Capacity TLC Sensor Assembly (No Load Cell)
NC000612	Grip Pin, Stainless Steel
NC003138	5/8" Eye End with 1/2-20M Thread, Stainless Steel
NC003031	Locking Rings (2 ea), Stainless Steel
NC003030	Spanner Wrench

Notes:
TLC Series load cells are supplied with the above standard accessories.

The SPK-TLC assemblies can be ordered for spares. These assemblies do NOT contain the TLC Load Cell- only the attachment accessories.

Shown: SPK-TLC-001

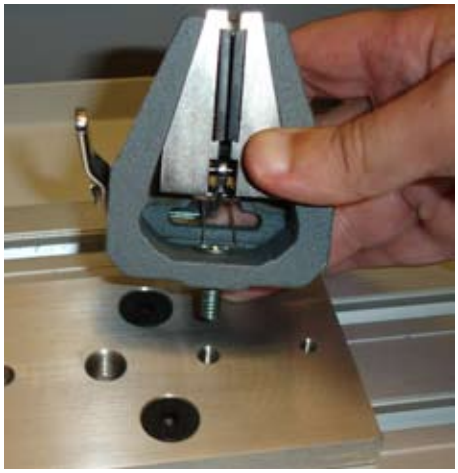
Shown: SPK-TLC-002

Shown: SPK-TLC-003

Mounting A Threaded Fixture

When using threaded grips or fixtures, we recommend the use of a knurled nut to help ensure that your fixture remains aligned properly.

Place the knurled nut onto the set screw. Screw the knurled nut on as fas as it will go. Next, screw on your fixture to the maximum position to where it is properly aligned to the work area. Then, use the knurled nut to tighten downward onto the fixture. This will ensure that the fixture remains tight and in the correct alignment throughout a test.



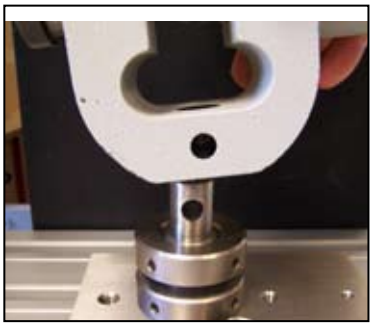
Shown: GF-9 Series thread-type testing fixture fastened to base mount using thread adapter.

Mounting An Eye End Fixture

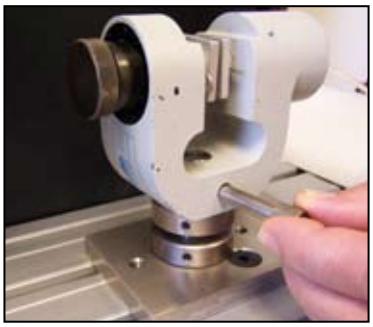
Eye end connections are easy to use. The eye end contains a 5/8-inch diameter post with through hole. The post also has a locking ring used to tighten down the attached fixture.

Position the fixture onto the post and orient the fixture so that it is properly aligned. Tighten the fixture into position using the locking ring. Thread the locking ring so that it is secure against the fixture.

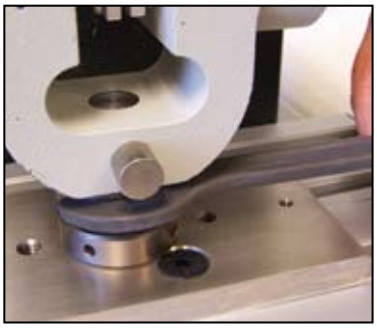
Next, place the grip pin through the fixture and the post.



Shown: Slide TG fixture onto eye end post.



Shown: Secure TG fixture with grip pin (p/n NC000612)



Shown: Align TG fixture and use locking ring to tighten onto eye end adapter with spanner wrench.

Using the Base Mounting Block

The base mounting block mounts securely to the t-slot table using two mounting screws. The mounting block has four (4) different mounting holes that mate to all Chatillon and Lloyd Instruments brand fixtures and accessories.

Care should be taken when mounting a fixture to the mounting block to ensure that the centerline of the fixture is aligned with the centerline of the TLC load cell and fixture combination that is fastened to the TCD crosshead.

Aligning Your Fixture Centerline

Before you fasten your top and bottom fixtures, insert the set screws or the end end adapters to the top (load cell) and bottom (mounting block).

Use the thumbwheel to slowly lower the crosshead downward until the top thread or eye end is just slightly higher than the lower thread or eye end. Be careful to not make contact with either set screw or eye end adapter.

Shown: Position together using thumbwheel. Use a slow speed to position eye ends together without touching.

Since the crosshead fixture is basically a fixed object, you can align your set screw or eye end by adjusting the position of your mounting block.

Slightly loosen the two mounting screws on the mounting block so that the mounting block can be moved smoothly towards/away-from the column.

Shown: Loosen mounting block screws.

Use a 90-degree object to align the top set screw or eye end to the bottom set screw or eye end.

Place the 90-degree object so that it is flush against the top set screw or eye end. Then slide the lower mounting block so that the bottom set screw or eye end is also flush against 90-degree object. Once they are aligned, you can tighten the mounting block to the T-slot table.

NOTE
It may be necessary to slightly loosen the load cell mounting adapter to align the top set screw or eye end with the bottom set screw or eye end. Remember to retighten the load cell mounting adapter before fastening the test fixtures or grips.

Move your crosshead upward to allow clearance for your fixtures.

Shown: Align the eye-ends using a 90-degree alignment square.

Shown: Position mounting block so that it aligns with 90-degree fixture.

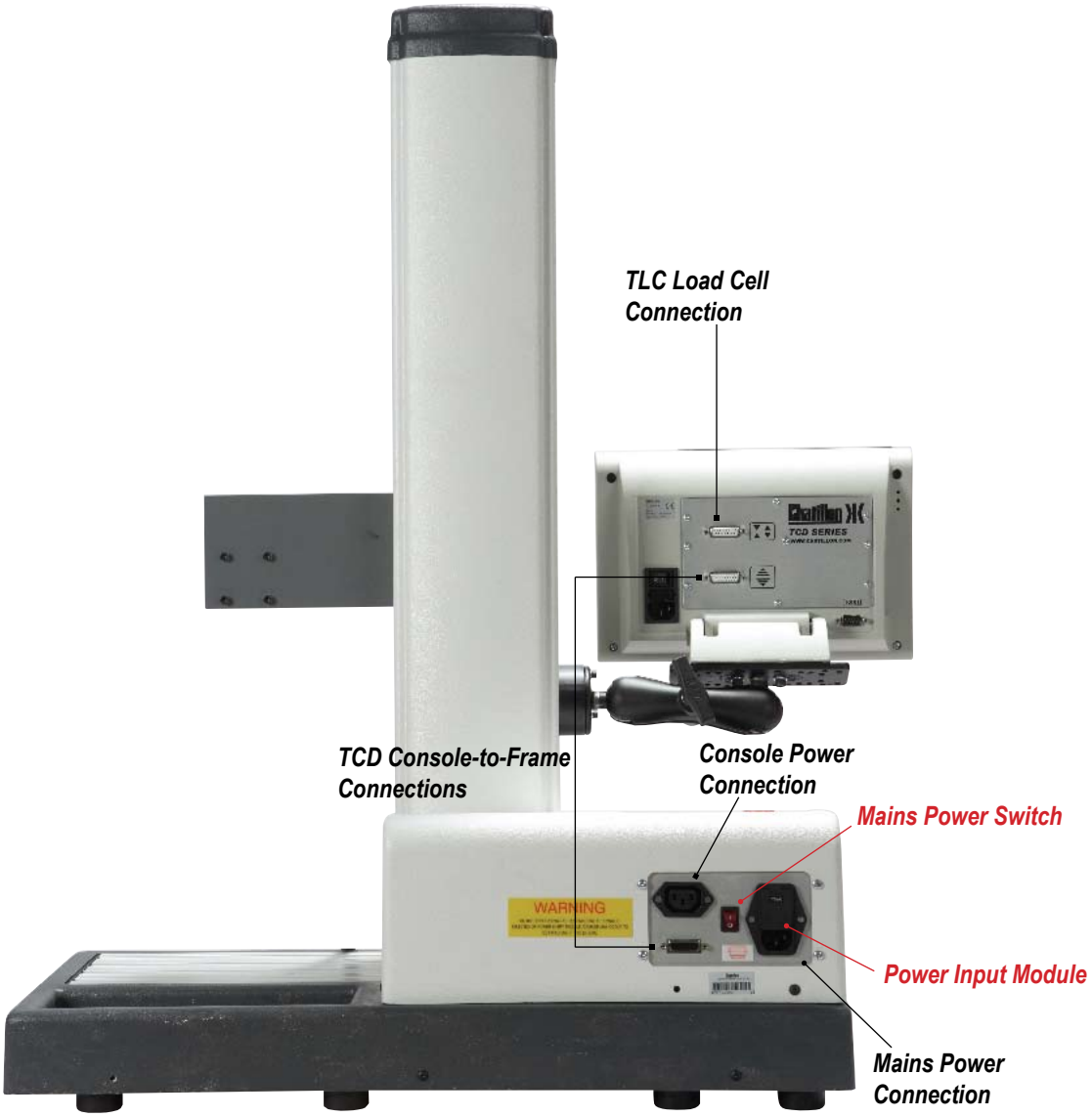
Shown: Loosen and align load cell adapter for parallelism adjustment if required. Adapter mounting screws located on the back of the crosshead.

Cable Connections

Your TCD System has three cable connections: console to frame connection, TLC load cell to console connection; and mains power cord connection.

CAUTION

Always make sure that the mains power switch is in the Off position when making cable connections. Connection or disconnection cables with the mains power switch in the On position can damage the equipment.



Connecting TCD Console

The TCD Console is connected to the TCD frame using the Console-to-Frame Interface Cable (p/n SPK-TCD-024). This cable is 3 ft (1 m) in length and has two 26-pin male D-type connectors.

Carefully connect the console-to-frame interface cable to the TCD frame. The connection is located on the back of the TCD frame, beneath the power cord input connection. Make sure that the pins are aligned before pushing the connector onto the mating connector. Be careful not to bend any of the pins. Secure the connection by tightening the mounting screws on the connector.

Next, connect the console-to-frame cable to the TCD Console. The connection is located on the back panel of the TCD Console (bottom connection). Make sure that the pins are aligned before pushing the connector onto the mating connector. Be careful not to bend any of the pins. Secure the connection by tightening the mounting screws on the connector.

Connecting TLC Sensor

The TLC Sensor cable has a 15-pin male D-type connector. The sensor has a retractable cord, that when fully extended, reaches approximately 9 ft (3 m) in length.

Carefully connect the TLC load cell cable to the TCD Console (top connector). The connection is located on the back of the TCD Console. Make sure that the pins are aligned before pushing the connector onto the mating connector. Be careful not to bend any of the pins. Secure the connection by tightening the mounting screws on the connector.

CAUTION
Always make sure that power to the TCD Console is Off before connecting your TLC Series load cell.

Power Cords

CAUTION
Your TCD System should be connected to an industrial-quality power surge suppressor. Your system should not be directly connected to a source power outlet.

The TCD System can be supplied with two types of power cords. The power cord should be used in conjuction with an industrial quality surge suppressor.

WARNING
Always make sure that the source power matches the Power Input Module setting of your TCD System before applying power to your system. Always verify the source power that you will be connecting your Power surge Suppressor and TCD System to before applying power to your system.

120V-Type Power Cord

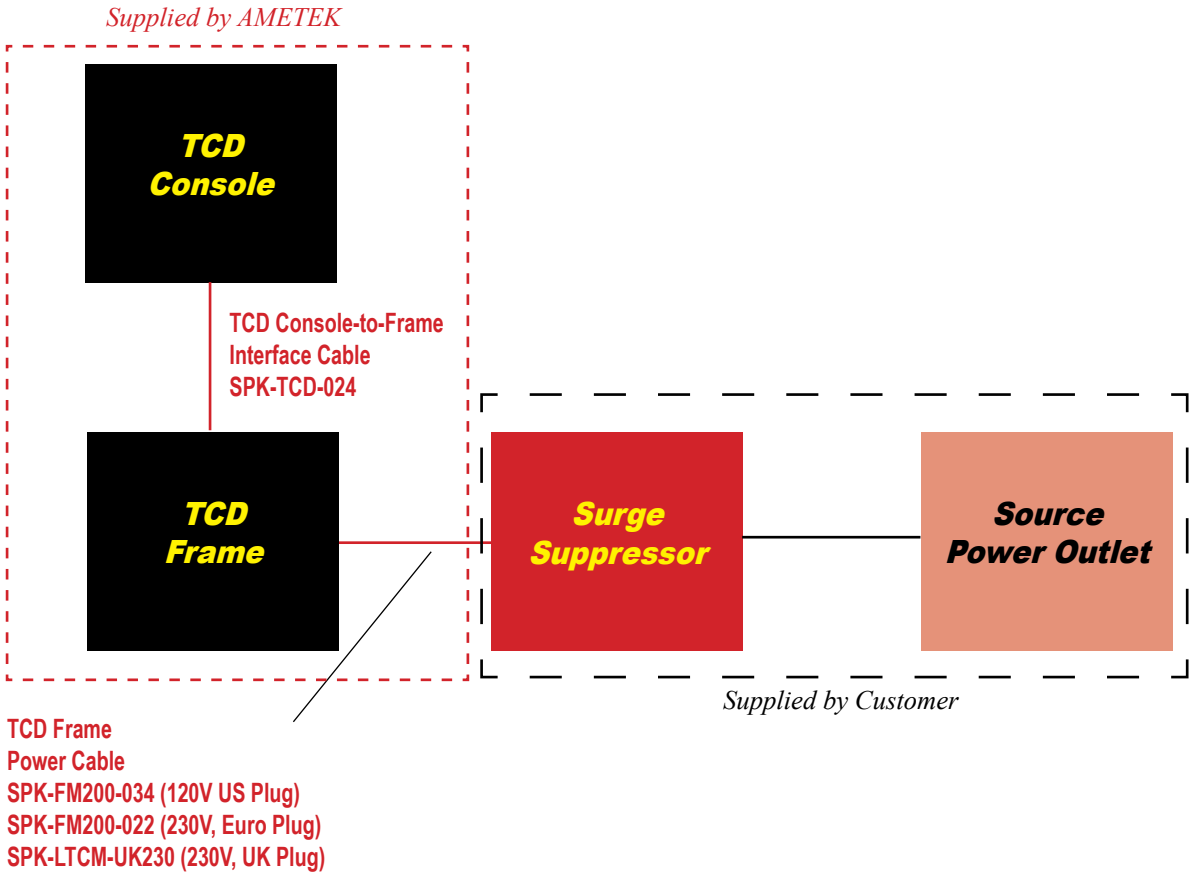
The 120-type power cord (p/n SPK-FM200-034) is supplied with all TCD Systems that utilize a 120Vac source power connection. This power cord has a female connector which mates to the back of the TCD225 frame and a 3-prong male connector for mating to your power surge suppressor.

Connect the female connector to the TCD frame before connecting to the source power outlet.

NOTE
Please read and understand the section "Powering Your Tester" before applying power to your TCD System.

230V-Type Power Cord

Two 230V-type power cord (p/n SPK-FM200-022, SPK-LTCM-UK230) are supplied with all TCD Systems that utilize a 230Vac source power connection. This power cord has a female connector which mates to the back of the TCD frame and a 2-prong male connector for mating to your power surge suppressor.



Recommended Power Connection- Block Diagram

Powering Your Tester

The CHATILLON® TCD System requires a stable 120V or 230V power source. The internal power transformer is switchable and operates at either 120V or 220V, Frequency 50/60Hz. Current ratins per TCD frame type are:

	120V	220V
❑ TCD110 Series	1A	.5A
❑ TCD225 Series	2A	1A
❑ TCD1100 Series	4A	3A

WARNING
Never substutute the required fuse with a higher or lower rated fuse.

Do not locate the power cord where it can be walked on or where it may create a tripping hazard.

Connect the power cable to only a 3-wire grounded industrial grade power surge suppressor. Connect the power surge suppressor to your source power outlet. Never connect a 2-wire or 3-wire adapter to the power cord or remove the third ground wire to fit the plug into a 2-wire electrical outlet. Modifying or overriding the third-wire ground creates a safety hazard and should not be permitted.

WARNING
Always connect the power cord from the source of AC power befor plugging it from the TCDpower connector. The AC voltage available at electrical outlets is extremly dangerous and can cause serious injury or death.

Power Surge Suppressor

Connect your TCD System through a high-quality power surge suppressor. Surge suppressors limit the amplitude of potentially damaging power line transiets caused by electrical machinery or lightning.

CAUTION
Industrial-quality surge suppressors are recommended. Surge suppressors found in inexpensive power strips are insufficient to protect your TCD System from damage.

Electrical Wiring and Connections

Perform regular inspections of all connections to your TCD System. Keep connections clean, secure and tight. Locate cables and cords away from moving objects. Take care to prevent tripping hazards.

Use shield cables to connect to your TCD System's output ports. Make sure that cables are properly terminated and firmly and securely connected at both ends.

Selecting Mains Power Source

The TCD System's Power Entry Module, located on the back panel of the TCD frame, contains an internal drum. This drum has four settings:

- ❑ 100Vac (Do NOT use)
- ❑ 120Vac (Use for standard 120V operation)
- ❑ 220Vac (Use for standard 220/230V operation)
- ❑ 240Vac (Do NOT use)

Use a flathead screwdriver to open the Power Entry Module. A small slot located at the top of the Power Entry Module locks the module closed. To unlock, position the screwdriver into the slot and carefully apply pressure.

Shown: Remove the power input drum. Select 120Vac or 220Vac. Reinsert drum making sure correct rating is displayed in window.

Shown: Replace he power input drum so that the matching source power appears thru window.

Shown: Press the fuse holder in the direction of the arrow and then pull out to expose the fuse. Replace with appropriately rated fuses only.

To set the power input, remove the Power Drum by pulling the drum from its socket. DO NOT ROTATE THE DRUM FROM WITHIN THE SOCKET.

CAUTION
Attempting to rotate the drum while still in the socket will damage the electrical connection. Do not rotate the drum from within the socket.

Reinsert the drum back into the socket so that respective power label matches your supply power. Close the Power Entry Module and make sure the correct label is displayed through the window.

CAUTION
Industrial quality surge surpressors are recommended. Surge supressors found in inexpensive power strips are insufficient to protect your TCD System from damage.

Replacing Fuse

The TCD frame uses two fast-blow , cartridge-typefuses (20 x 5mm) fuses. The fuses are located inside the Power Entry Module.

To inspect and replace the fuses, squeeze together the fuse holders in the direction of the arrows on each holder and pull the holder out. The fuse is connected to the holder and can be easily removed and replaced.

WARNING
Replace the fuses with the exact same type and rating as the ones supplied from the factory. Replace with fast-blow type fuses only.

Do not replace with higher or lower rated fuses.

Fuse Ratings & Part Numbers

Frame Model	Fuse	Part No.
TCD110 Series	1A	E09-409
TCD225 Series	3A	E09-825
TCD1100 Series	5A	E09-834

Mains Power Switch

The mains power switch, located on the back panel of the TCD frame is the system's master power switch. This switch is the only device that can be used to turn off power to the system.

The mains power switch should be used whenver power is to be completely turned off to the system.

The mains power switch is a two-position switch with an Off position (O) and an On position (I). The mains power switch contains an LED that illuminates when power to the system is On.

CAUTION

Certain high voltage discharges near the connector may cause a test setup to terminate prematurely. In the unlikely event that a high voltage discharge occurs near the connector, please power cycle the tester.

WARNING

The mains power switch should be turned Off whenever service is being performed on the TCD System. Always verify that power to the system is Off be verifying that the mains power switch is in the Off position. Never assume that power to the system is Off because the LED on the switch is not lighted.

The only way to completely remove power to the TCD frame, TCD Console and TLC load cell is to place the mains power switch in the Off position.

Jog Wheel Operation

The jog wheel is located on the front panel of the TCD frame. The jog wheel is intended for fixture setup and alignment. Rotating the jog wheel upward causes the crosshead to move in an upward direction. Rotating the jog wheel downward causes the crosshead to move in a downward direction. The speed of the crosshead movement is controlled by the speed of the jog wheel rotation. The jog wheel is spring activated and has a home position. Take care when moving the jog wheel so as not to over-rotate that may damage the jog wheel mechanism.

CAUTION

The jog wheel is intended for use during fixture setup and alignment only. It should not be used to manually conduct a test.

Shown: Rotating the job thumbwheel upward causes the crosshead to move upward. Rotating the thumbwheel downward causes the crosshead to move downward.

Emergency Stop Switch

The emergency stop switch is located on the front panel directly beneath the TCD Console mounting.

The emergency stop switch removes power to the TCD System. Pressing the emergency stop switch removes power to all system components including the TCD frame and TCD Console. To release the emergency stop, rotate and release the switch.

WARNING

The emergency stop switch removes power to the system. When depressed, it removes power to the frame's motion controller and all system components, including the console.

Shown: The emergency stop is located on the TCD frame's front panel, directly beneath the TCD Console.

STOP ACTION SYMBOL

The STOP ACTION symbol identifies the emergency stop function. When the emergency stop switch is engaged (pushed in), the motor drive and crosshead will stop. All motion is discontinued.

Mechnical Limit Setup

The TCD frame has two mechanical limits located on the front of the column. The mechanical limits are provided as a means of protecting your TCD System from accidental sensor overload situations caused by crosshead over travel.

When the crosshead is moving upward or downward and makes physical contact with either of the mechanical limit switches, the crosshead will immediately stop. Therefore, you should position the mechanical limit switches at locations that would prevent the crosshead movement that may cause an overload to the TLC sensor.

Using Mechanical Limits

The TCD frame has adjustable mechanical limits that are designed to help protect your TLC load cell from overloads. These limits are called extension or deflection limits and are designed to stop the machine's crosshead travel when the internal microswitch is contacted by the crosshead.

The front of the TCD column features a ruler with two adjustable mechanical limits switches. One switch is for the HIGH Limit. The other switch if for the LOW Limit. The limit switches should be positioned using the ruler, so that the crosshead will stop when contact is made with the High or Low switch.

CAUTION

The High and Low Limit switches are provided to prevent damage to the load cell. Always position and test the mechanical limits to ensure that they prevent the crosshead from moving to a distance that might result in a measured load that it greater than the load cell's capacity.

NOTE

The TCD Console's bargraph and crosshead status will illuminate RED when the measured load is at 90% of the installed load cell's capacity. We recommend that the High and Low limits be set to where the bar graph and crosshead status show in Red.

Shown: Position the upper limit switch at a location that prevents tensile overloading from occurring. Use the thumbwheel to move the crosshead upward while viewing the load being measured by the load cell. Loosen the limit screw and slide the switch to the desired location (90% load capacity). Re-tighten screw.

Position the lower limit switch at a location that prevents compression overloading from occurring. Use the thumbwheel to move the crosshead downward while viewing the load being measured by the load cell. Loosen the limit screw and slide the switch to the desired location (90% load capacity). Re-tighten screw.

Setting HIGH Limit

Limits are supplied to protect your load cell and TCD frame. The HIGH Limit protects the load cell by preventing the crosshead from traveling beyond a distance that would apply a load that is greater than the load cell's capacity.

The HIGH Limit is designed to protect the gauge when the crosshead is in the UPWARD travel direction.

To set the limit, loosen the thumbscew by turning the screw in a counterclockwise direction. You only need to loosen the screw enough so that the switch slides along the internal guide. When the screw is loose, slide the mechanism to the desired extension position. Tighten the screw by turning clockwise.

Test your setting using a slow crosshead speed, e.g. 0.4 in/min (10 mm/min). Move the crosshead in an UPWARD direction and watch to see where the crosshead makes contact and ensure that contact with the limit switch stopped the crosshead travel. If the crosshead stops too soon or too late, adjust the thumbscrew, reposition the limit mechanism and repeat the test.

Setting LOW Limit

The LOW Limit is designed to protect the load cell when the crosshead is in the DOWNWARD travel direction.

To set the limit, loosen the thumbscew by turning the screw in a counterclockwise direction. You only need to loosen the screw enough so that the switch slides along the internal guide. When the screw is loose, slide the mechanism to the desired extension position. Tighten the screw by turning clockwise.

Testing the Limit Switch

Once you have positioned your Limit Switch, test to ensure that it is operating properly.

Lower Limit Switch Test

Drive the crosshead in a downward direction. While the crosshead is moving downward, press downward on the lower Limit Switch. The crosshead should stop moving.

Upper Limit Switch Test

Drive the crosshead in an upward direction. While the crosshead is moving upward, press the upper Limit Switch upward. The crosshead should stop moving.

Switch Engagement

Check to ensure that the crosshead engages both the Upper and Lower Limit Switches during its travel. You should hear a “click” when the crosshead makes contact with the switch. The crosshead should stop moving.

CAUTION
Always test the positions of your High and Low limit swiches. Ensure that they stop the crosshead travel when engaged.

Shown: Test both limit switches by manually triggering an overload condition. Press down on the Low limit swtich and up on the High limit switch while the crosshead is moving. Both actions should stop crosshead movement.

Cleaning Your TCD Frame

Use only a soft cloth dampened with water and mild detergent for clean exterior surfaces. Never use abrasive cleaners and never use strong detergents or solvents. Only a damp cloth should be used. Do not use a cloth that is dripping wet.

Keep the t-slot area clean of debris and dust. Use an air hose to remove debris and dust from the t-slot channels. Be careful to keep debris and dust from entering the inside of the column.

Have your authorized Chatillon representative perform annual preventive maintenance on your TCD System. This will include cleaning and preventive maintenance.

NOTE
AMETEK recommends that your TCD System undergo annual preventive maintenance from an authorized Chatillon represetnative.

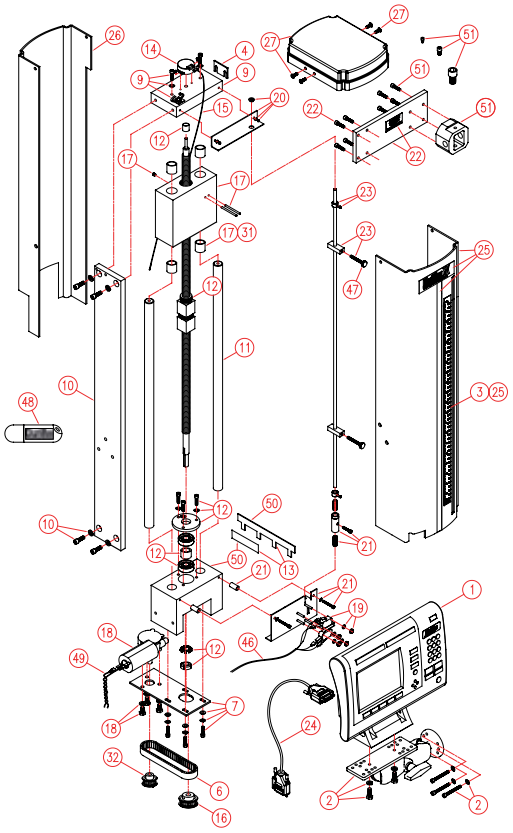
Servicing Your TCD Frame

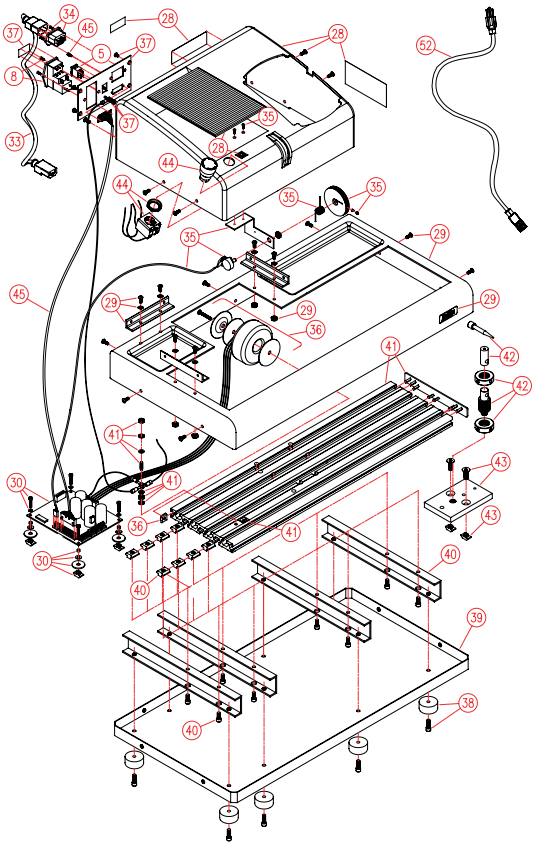
The TCD System is a precision measuring instrument that should undergo annual preventive maintenance by an authorized Chatillon representative.

DANGER
Do not open the TCD Console or TCD Frame enclosures. There are no user-serviceable components or assemblies inside. All service should be performed by an authorized Chatillon representative. For a listing of authorized Chatillon representative, please visit www.chatillon.com.

If you require service for your TCD Console, TCD frame or TLC Series load cell, please contact your authorized Chatillon representative where your purchased your equipment.

Spare Parts Listing
TCD110 Series

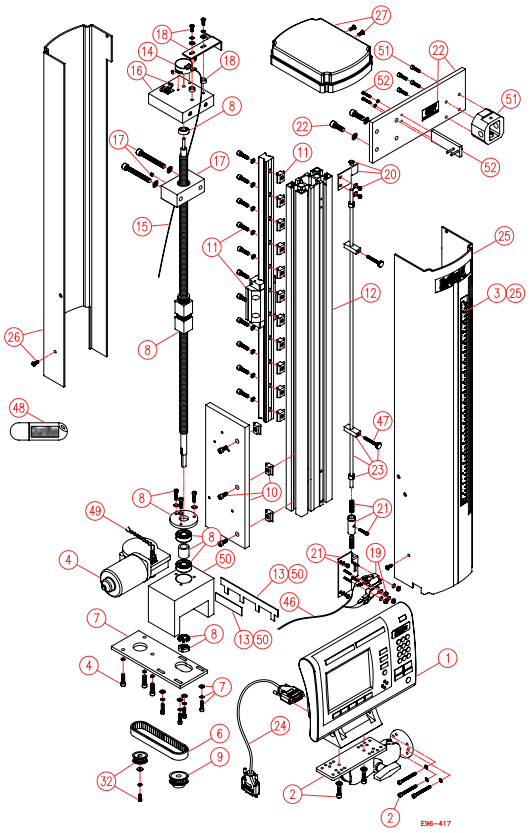


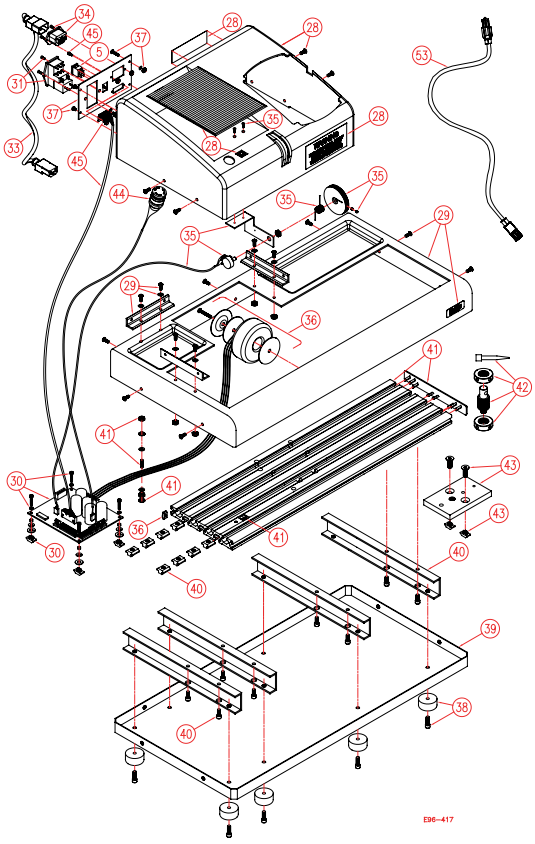


Ref No.	Part Number	Description
1	SPK-TCD-001	TCD Console Assembly
2	SPK-TCD-002	Console Mounting Assembly
3	SPK-LTCM-003	Ruler Insert, 20-inch (510mm)
4	SPK-TCD110-004	Cover Spacer, TCD110
5	SPK-LTCM-005	Switch, Power
6	SPK-TCD110-006	Timing Belt, TCD110
7	SPK-TCD110-007	Motor Mounting Plate
8	SPK-LTCM-008	Power Entry Module Assembly, 1A
9	SPK-TCD110-009	Upper Block, TCD110
10	SPK-TCD110-010	Side Plate Assembly
11	SPK-TCD110-011	Column Guide Rods, 2 each
12	SPK-TCD110-012	Ball Screw Assembly, TCD110
13	SPK-TCD-013	Barrier Assembly
14	SPK-TCD-014	Encoder, TCD
15	SPK-TCD-015	Cable, Encoder Assembly
16	SPK-LTCM-016	Ball Screw Pulley
17	SPK-TCD110-017	Ram Bearing Block, TCD110
18	SPK-LTCM-018	Motor Assembly
19	SPK-LTCM-019	Limit Switch, with Brackets, 2 each
20	SPK-TCD110-020	Upper Limit Switch Bracket Assy
21	SPK-TCD110-021	Lower Limit Switch Bracket Assy
22	SPK-TCD110-022	Arm Ram, TCD110
23	SPK-TCD110-023	Limit Switch Rod Assy, TCD110
24	SPK-TCD-024	Console-to-Frame Cable Assy
25	SPK-TCD110-025	Front Cover Assembly, TCD110
26	SPK-TCD110-026	Rear Cover Assembly, TCD110
27	SPK-TCD110-027	Top Cover Assembly, TCD110

Ref No.	Part Number	Description
28	SPK-TCD110-028	Motor Cover Assembly, TCD110
29	SPK-TCD-029	Base Cover Assembly
30	SPK-TCD-030	Motor Amplifier PCB, Small
31	SPK-TCD110-031	Bushing Set, 4 each
32	SPK-LTCM-015	Motor Pulley
33	SPK-TCD-033	Power Cord Jumper
34	SPK-TCD-034	Power Outlet Assembly
35	SPK-TCD-035	Jog Wheel Assembly, Calibrated
36	SPK-TCD110-036	Transformer Assembly, TCD110
37	SPK-TCD-037	Switch Plate Assembly
38	SPK-TCD-038	Feet Assembly (8)
39	SPK-TCD-039	Bottom Pan
40	SPK-TCD-040	Frame Support Assembly
41	SPK-TCD-041	Bottom Base, T-slot
42	SPK-TCD-042	Bottom, Eye End, 5/8-inch, Assy
43	SPK-TCD-043	Base Fixture Mount
44	SPK-TCD-044	E-Stop Switch Assembly
45	SPK-TCD-045	Motor Amplifier Cable Assembly
46	SPK-TCD-046	Cable Assembly, Limit Switches
47	SPK-TCD-047	Thumb Screw Assembly, 2 each
48	SPK-TCD-048	USB Flash Drive, 1GB
49	SPK-TCD-049	Cable, Motor Assembly
50	SPK-TCD110-050	Bottom Block Assembly, TCD110
51	SPK-TCD-051	Load Cell Mounting Adapter
52	SPK-FM200-034	Power Cord, 115Vac, US Mains Plug
	SPK-FM200-022	Power Cord, 230Vac, EU Mains Plug
	SPK-LTCM-UK230	Power Cord, 230Vac, UK Mains Plug
*	E09-409	1A Fuse (not shown)

Spare Parts Listing
TCD225 Series

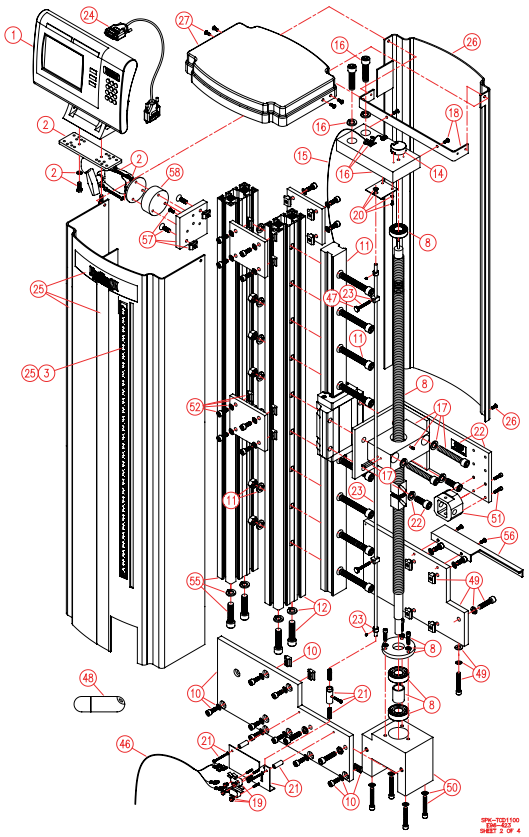


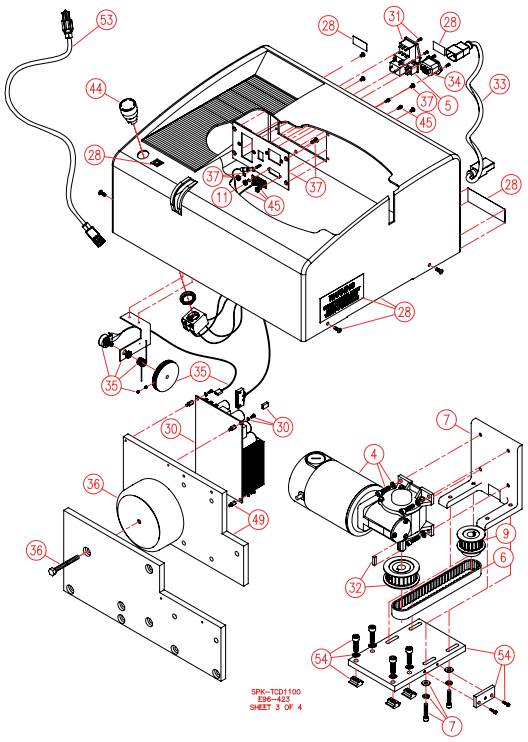


Ref No.	Part Number	Description
1	SPK-TCD-001	TCD Console Assembly
2	SPK-TCD-002	Console Mounting Assembly
3	SPK-LTCM-003	Ruler Insert, 20-inch (510mm)
4	SPK-TCD225-004	Motor Assembly, TCD225
5	SPK-LTCM-005	Switch, Power
6	SPK-TCD225-006	Timing Belt, TCD225
7	SPK-TCD225-007	Motor Mounting Plate
8	SPK-TCD225-008	Ball Screw Assembly, TCD225
9	SPK-TCD225-009	Ball Screw Pulley
10	SPK-TCD225-010	Side Plate Assembly
11	SPK-TCD225-011	Linear Rail Assembly, TCD225
12	SPK-TCD225-012	Column, Aluminum, TCD225
13	SPK-TCD-013	Barrier Assembly
14	SPK-TCD-014	Encoder, TCD
15	SPK-TCD-015	Cable, Encoder Assembly
16	SPK-TCD225-016	Upper Block, TCD225
17	SPK-TCD225-017	Ram, TCD225
18	SPK-TCD225-018	Cover Brackets, TCD225
19	SPK-LTCM-019	Limit Switch, with Brackets (2)
20	SPK-TCD225-020	Upper Limit Switch Bracket Assy
21	SPK-TCD225-021	Lower Limit Switch Bracket Assy
22	SPK-TCD225-022	Arm Ram, TCD225
23	SPK-TCD225-023	Limit Switch Rod Assy, TCD225
24	SPK-TCD-024	Console-to-Frame Cable Assy
25	SPK-TCD225-025	Front Cover Assembly, TCD225
26	SPK-TCD225-026	Top Cover Assembly, TCD225
27	SPK-TCD225-027	Rear Cover Assembly, TCD225

Ref No.	Part Number	Description
28	SPK-TCD225-028	Motor Cover Assembly, TCD225
29	SPK-TCD-029	Base Cover Assembly, TCD225
30	SPK-TCD-030	Motor Amplifier PCB, TCD225
31	SPK-TCD225-031	Power Entry Module Assy, 3A
32	SPK-TCD225-032	Motor Pulley
33	SPK-TCD-033	Power Cord Jumper
34	SPK-TCD-034	Power Outlet Assembly
35	SPK-TCD-035	Jog Wheel Assembly, Calibrated
36	SPK-TCD225-036	Transformer Assembly, TCD225
37	SPK-TCD-037	Switch Plate Assembly
38	SPK-TCD-038	Feet Assembly (8)
39	SPK-TCD-039	Bottom Pan
40	SPK-TCD-040	Frame Support Assembly
41	SPK-TCD-041	Bottom Base, T-slot
42	SPK-TCD-042	Bottom, Eye End, 5/8-inch, Assy
43	SPK-TCD-043	Base Fixture Mount
44	SPK-LTCM-006	E-Stop Switch Assembly
45	SPK-TCD-045	Motor Amplifier Cable Assembly
46	SPK-TCD-046	Cable Assembly, Limit Switches
47	SPK-TCD-047	Thumb Screw Assembly (2)
48	SPK-TCD-048	USB Flash Drive, 1GB
49	SPK-TCD-049	Cable, Motor Assembly
50	SPK-TCD225-050	Bottom Block Assembly, TCD225
51	SPK-TCD-051	Load Cell Mounting Adapter
52	SPK-TCD225-052	Limit Switch Actuator Assembly
53	SPK-FM200-034	Power Cord, 115Vac, US Mains Plug
	SPK-FM200-022	Power Cord, 230Vac, EU Mains Plug
	SPK-LTCM-UK230	Power Cord, 230Vac, UK Mains Plug
*	E09-825	3A Fuse (not shown)

Spare Parts Listing
TCD1100 Series

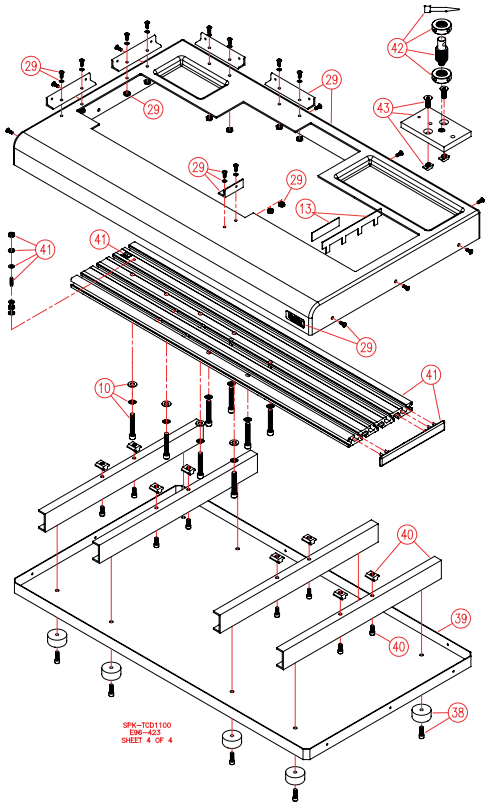




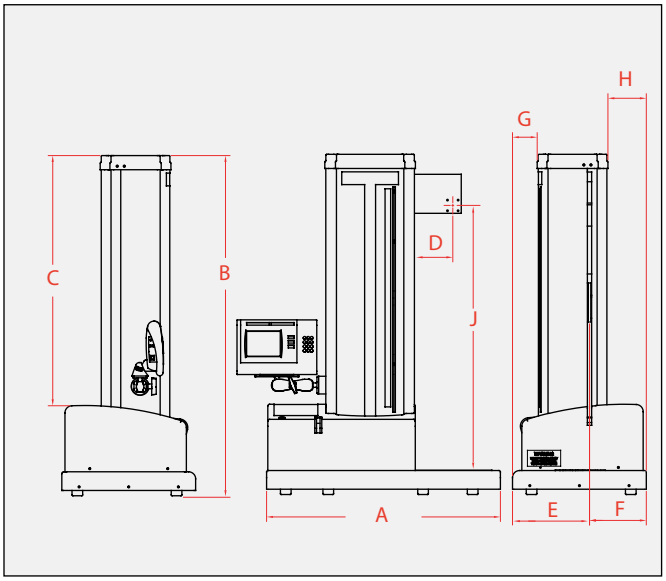
Ref No.	Part Number	Description
1	SPK-TCD-001	TCD Console Assembly
2	SPK-TCD-002	Console Mounting Assembly
3	SPK-LTCM-043	Ruler Insert, 30-inch (760mm)
4	SPK-TCD225-004	Motor Assembly, TCD225
5	SPK-LTCM-005	Switch, Power
6	SPK-TCD1100-006	Timing Belt, TCD1100
7	SPK-TCD1100-007	Motor Mounting Plate
8	SPK-TCD1100-008	Ball Screw Assembly, TCD1100
9	SPK-TCD1100-009	Ball Screw Pulley
10	SPK-TCD1100-010	Front Plate Assembly
11	SPK-TCD1100-011	Linear Rail Assembly, TCD1100
12	SPK-TCD1100-012	Column, Aluminum, TCD1100
13	SPK-TCD-013	Barrier Assembly
14	SPK-TCD-014	Encoder, TCD
15	SPK-TCD-015	Cable, Encoder Assembly
16	SPK-TCD1100-016	Upper Block, TCD1100
17	SPK-TCD1100-017	Ram, TCD1100
18	SPK-TCD1100-018	Top Rear Cover Bracket, TCD1100
19	SPK-LTCM-019	Limit Switch, with Brackets (2)
20	SPK-TCD1100-020	Upper Limit Switch Rod Support
21	SPK-TCD1100-021	Lower Limit Switch Bracket Assy
22	SPK-TCD1100-022	Arm Ram Assy, TCD1100
23	SPK-TCD1100-023	Limit Switch Rod Assy, TCD1100
24	SPK-TCD-024	Console-to-Frame Cable Assy
25	SPK-TCD1100-025	Front Cover Assembly, TCD1100
26	SPK-TCD1100-026	Rear Cover Assembly, TCD1100
27	SPK-TCD1100-027	Top Cover Assembly, TCD1100
28	SPK-TCD1100-028	Motor Cover Assembly, TCD1100
29	SPK-TCD1100-029	Base Cover Assembly, TCD1100
30	SPK-TCD1100-030	Motor Amplifier PCB, TCD1100

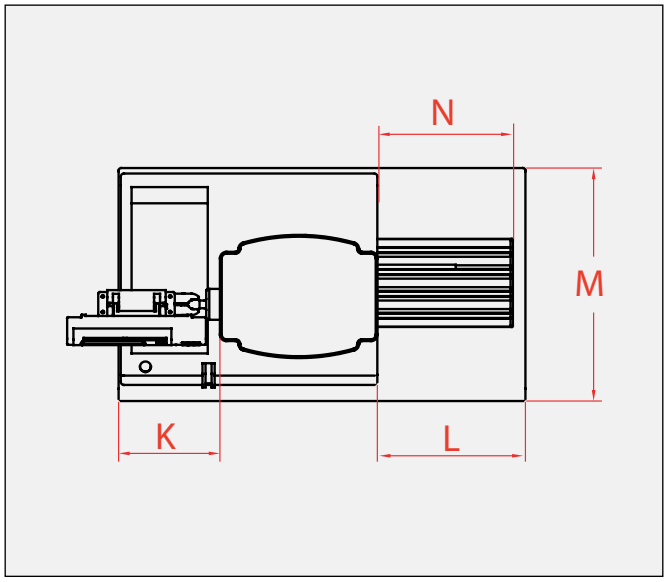
Ref No.	Part Number	Description
31	SPK-TCD1100-031	Power Entry Module Assy, 5A
32	SPK-TCD1100-032	Motor Pulley, TCD1100
33	SPK-TCD-033	Power Cord Jumper
34	SPK-TCD-034	Power Outlet Assembly
35	SPK-TCD-035	Jog Wheel Assembly, Calibrated
36	SPK-TCD1100-036	Transformer Assembly, TCD1100
37	SPK-TCD-037	Switch Plate Assembly
38	SPK-TCD-038	Feet Assembly (8)
39	SPK-TCD1100-039	Bottom Pan, TCD1100
40	SPK-TCD1100-040	Frame Support Assembly, TCD1100
41	SPK-TCD1100-041	Bottom Base, T-slot, TCD1100
42	SPK-TCD-042	Bottom, Eye End, 5/8-inch, Assy
43	SPK-TCD-043	Base Fixture Mount
44	SPK-LTCM-006	E-Stop Switch Assembly
45	SPK-TCD-045	Motor Amplifier Cable Assembly
46	SPK-TCD-046	Cable Assembly, Limit Switches
47	SPK-TCD1100-047	Thumb Screw Assembly (2)
48	SPK-TCD-048	USB Flash Drive, 1GB
49	SPK-TCD1100-049	Cable, Motor Assembly, TCD1100
50	SPK-TCD1100-050	Bottom Block Assembly, TCD1100
51	SPK-TCD-051	Load Cell Mounting Adapter
52	SPK-TCD1100-052	Connection Plate Assy, TCD1100
53	SPK-FM200-034	Power Cord, 115Vac, US Mains Plug
	SPK-FM200-022	Power Cord, 230Vac, EU Mains Plug
	SPK-LTCM-UK230	Power Cord, 230Vac, UK Mains Plug
54	SPK-TCD1100-054	Motor Bracket Plate Assy, TCD1100
55	SPK-TCD1100-055	Rear Column Extrusion, TCD1100
56	SPK-TCD1100-056	Back Cover Support Assy, TCD1100
57	SPK-TCD1100-057	Console Mounting Plate, TCD1100
58	SPK-TCD-058	Console Mount Spacer
*	E09-834	5A Fuse (not shown)

Spare Parts Listing
TCD1100 Series



Dimensions





Machine Dimensions

Ref.	TCD110	TCD225	TCD1100
A	27.3” (693mm)	27.3” (693mm)	33.0” (838mm)
B	31.25” (794mm)	36.5” (927mm)	47.21” (1199mm)
C	21.9” (556mm)	27.1” (688mm)	35.27” (896mm)
D	5.16” (131mm)	5.16” (131mm)	5.16” (131mm)
E	6.06” (154mm)	6.25” (159mm)	10.87” (276mm)
F	7.51” (191mm)	4.95” (126mm)	8.01” (203mm)
G	1.77” (50mm)	2.125” (54mm)	3.48” (88mm)
H	4.86” (123mm)	4.5” (114mm)	5.41” (137mm)
J	15.0” (380mm)	20.0” (510mm)	30.0” (762mm)

Work Space Dimensions

Ref.	TCD110	TCD225	TCD1100
K	8.75” (222mm)	9.25” (235mm)	8.2” (209mm)
L	12.2” (310mm)	12.2” (310mm)	12.01” (305mm)
M	14.3” (362mm)	14.3” (362mm)	18.88” (480mm)
N	11.2” (284mm)	12.125” (308mm)	10.89” (277mm)

AMETEK®

Visit us on the web at www.chatillon.com

Americas
AMETEK
Measurement & Calibration Technologies
8600 Somerset Drive
Largo, Florida 33773
United States of America
Tel +1-727-536-7831
Tel +1-800-527-9999 (USA Only)
Fax +1-727-539-6882
chatillon.fl-lar@ametek.com

France
AMETEK S.A.S.
Rond Point de l”Epine des Champs
Buro Plus - Bat. D
78990 Elancourt
France
Tel +33 (0) 1 30 68 89 40
Fax +33 (0) 1 30 68 89 49
general.lloyd-instruments@ametek.fr

Germany
AMETEK GmbH
Rudolf-Diesel-Strasse 16
D-40670 Meerbusch
Germany
Tel +49 (0) 2159 9136-0
Fax +49 (0) 2159 9136-39
info@ametek.de

Singapore
AMETEK Singapore Pte. Ltd.
10 Ang Mo Kio Street 65
#05-12 Techpoint
Singapore 569059
Tel +65 6484 2388
Fax +65 6481 6588
aspl@ametek.com.sg

United Kingdom
AMETEK
Lloyd Instruments Ltd.
12 Barnes Wallis Road
Segensworth East, Fareham
Hants, PO15 5TT
United Kingdom
Tel +44 (0) 1489 486 399
Fax +44 (0) 1489 885 118
uk-far.general@ametek.co.uk

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